

**UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
OAKLAND DIVISION**

EPIC GAMES, INC.,	)	Case No. 4:20-cv-05640-YGR-TSH
	)	
Plaintiff, Counter-defendant,	)	<b>REBUTTAL WRITTEN DIRECT</b>
	)	<b>TESTIMONY OF DR. DAVID S. EVANS</b>
v.	)	
	)	The Honorable Yvonne Gonzalez Rogers
APPLE INC.,	)	
	)	Trial: May 3, 2021
Defendant, Counterclaimant.	)	<b>Ex. Expert 16</b>
	)	

REBUTTAL WRITTEN DIRECT  
TESTIMONY OF DR. DAVID S. EVANS

CASE No. 4:20-cv-05640-YGR-TSH

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## I. Assignment and Opinions

1. My name is David S. Evans and I submitted written direct testimony (“Opening”) on April 20, 2021. Counsel for Epic asked me to provide my opinions, as an economist, on the opinions of Professors Hitt, Lafontaine, [REDACTED] and Schmalensee (“Apple’s Experts”), submitted in writing on April 23, 2021.<sup>1</sup> I set forth my key opinions and the bases for them herein and, if asked to do so, will elaborate on these opinions and offer additional ones at trial.

2. My opinions are summarized below, divided into three main categories:

### **Apple’s app distribution restrictions: the relevant market, Apple’s monopoly power, and anticompetitive effects**

- (i) The digital game transaction platform market proposed by Apple’s experts is not an economically sound market for assessing Apple’s conduct. (Pages 5-7.)
- (ii) My economic analysis of the relevant antitrust foremarket and aftermarket, including the hypothetical monopolist tests (“HMTs”), does not suffer from the flaws Apple’s experts claim. (Pages 7-14.)
- (iii) Apple’s experts do not have a sound basis for disregarding Apple’s calculation of the App Store profit margins and my conclusion that these data demonstrate the App Store has monopoly power in iOS app distribution. (Pages 14-16.)
- (iv) Professor Hitt’s claims that the App Store’s commissions have declined over time, and the rate is only 4.7% for all apps and 8.1% for games, are wrong because they are based on erroneous calculations and conceptual errors. (Pages 16-17.)

### **Apple’s IAP restrictions: the relevant market, Apple’s monopoly power, and anticompetitive effects**

- (i) The App Store differs from an art gallery in critical ways that Professor Schmalensee ignores in choosing this as his key analogy. (Page 18.)
- (ii) IAP is not an “integral part” of the App Store or an input into the production of transactions like merchant acceptance for American Express, as Professor Schmalensee claims. (Page 19.)

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<sup>1</sup> Written Direct Testimony of Lorin M. Hitt, Ph.D. (“Hitt Testimony”); Written Direct Testimony of Francine Lafontaine, Ph.D. (“Lafontaine Testimony”); [REDACTED] Written Direct Testimony of Richard Schmalensee, Ph.D. (“Schmalensee Testimony”).

- (iii) Apple could provide IAP and app distribution separately to developers of digital content apps and compete on the merits, contrary to Professor Schmalensee. (Page 20.)
- (iv) The HMT for the iOS in-app payment solution market is based on a highly conservative competitive commission rate of 23.2%, not the average payment processing rate of 5% as claimed by Professor Schmalensee. (Pages 20-21.)
- (v) Professor Schmalensee has provided no economic evidence that developers could profitably operate different businesses to avoid Apple's IAP-distribution tie. The fact that developers would forgo a particular type of business to avoid the tie is evidence that the tie harms competition and consumers, who are denied new and innovative products. (Pages 21-22.)

#### **Apple's procompetitive justifications**

- (i) The available evidence does not support [REDACTED] the views that an OS provider must distribute apps exclusively to operate efficiently, or that requiring Apple to compete on the merits in app distribution would blunt its incentives to innovate. (Pages 22-23.)
- (ii) It isn't plausible that the App Store can prosper only as a monopolist, and could not succeed in the but-for world in which it competes on the merits in app distribution and payment solutions. (Page 23.)
- (iii) Apple's experts provide no economic analysis or evidence that Apple's app distribution or payment solution restrictions *caused* Apple to invest more in the App Store, or in the iOS ecosystem more generally, than it would have in the absence of these restrictions, or that ending these restrictions would cause Apple to invest less. The actual evidence is contrary to their speculation. (Pages 23-24.)

## **II. Market Definition Principles**

3. The following economic concepts are not controversial in the economic literature on, and practice of, market definition, and are the ones I followed in my opening testimony.

- i. Market definition starts with the defendant's conduct, where the defendant is a "supplier" that sells to individuals or other businesses who are its "customers".

- ii. The market definition analysis seeks to identify other suppliers that customers could turn to, and that would thereby impose competitive constraints on the defendant's conduct.
- iii. A critical concept is whether products are sufficiently strong substitutes, which means that an increase in the price of the product of one supplier would lead customers to divert significant demand to the product of another supplier, and thereby discipline a supplier's ability to raise price (or decrease quality).
- iv. The HMT is a standard framework for assessing whether the market includes the relevant substitute products.

4. Apple's experts do not accept some of these principles and do not follow others. Professor Lafontaine says that market definition should focus on the substitutes available to the *plaintiff customer* and similarly situated customers.<sup>2</sup> That's the approach Professor Hitt implements and Professor Schmalensee endorses. They have downplayed the use of the HMT and have not conducted any tests of their own.<sup>3</sup>

### **III. There Is a Relevant Antitrust Foremarket for Smartphone OSs and Apple Has Substantial Market Power in That Market**

5. Professor Schmalensee claims that my discussion of smartphones and smartphone OSs is a "distraction". That is not so; after all, the defendant is Apple, the conduct at issue involves its iOS operating system which it bundles with its iPhone, its App Store which is also bundled with its iPhone, and iOS-compatible apps. He does not respond to the detailed quantitative and qualitative evidence I put forward that OSs and app distribution are separate products, usually provided in separate markets,<sup>4</sup> and the quantitative and qualitative evidence that there is a relevant market for smartphone OSs only consisting of iOS and Android. Instead, he makes two invalid criticisms of the HMT I performed to further confirm the market boundaries, which he wrongly refers to as "an elaborate attempt to distract."

6. He asserts that there cannot be a smartphone OS market because Apple and Google do not charge explicit positive prices for their OSs.<sup>5</sup> This argument ignores the extensive economic literature on how to handle market definition when prices are zero, which has become a common feature for modern products. That literature does not say that no such market can be defined.<sup>6</sup> Suppose there is a relevant market that includes two OSs that were sold at positive

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<sup>2</sup> Lafontaine Testimony, ¶ 25.

<sup>3</sup> Schmalensee Testimony, ¶¶ 81, 106; Lafontaine Testimony, ¶ 37.

<sup>4</sup> Opening, ¶¶ 105-108, 163-179.

<sup>5</sup> Schmalensee Testimony, ¶¶ 61, 92.

<sup>6</sup> David Evans (2011), "The Antitrust Economics of Free," Competition Policy International, Spring 2011; Lapo Filistrucchi (2018), "Market Definition in Multi-Sided Markets," in OECD, *Rethinking Antitrust Tools for Multi-Sided Platforms*,

prices. That market would not disappear as an economic matter if one of those OSs decided to bundle the OS with a computer and the other decided to license the OS for free and make money from advertising. Regardless of how they are priced, the two OSs would still be competing for app users and developers—as iOS and Android currently are. The smartphone OS market I have defined is consistent with the business realities and actual choices for consumers and developers.

7. Professor Schmalensee also claims I ignored indirect network effects, contrary to my prior writings.<sup>7</sup> That is not so. In the context of a HMT for a two-sided platform, the issue concerns the magnitude of indirect network effects *in reverse*—the extent to which an increase in price to users results in a loss of developers which leads to a further loss of users. I have expressly considered this, and the quantitative and qualitative evidence I presented shows why reverse indirect network effects aren’t material. Given the important differences between smartphones and other devices, smartphone OS users cannot turn to gaming console and personal computer OSs for downloading and using apps. Likewise developers could not turn to console and personal computer OSs to access the substantial user demand that depends on the unique features of smartphones and their OSs. Professor Schmalensee ignores this part of my analysis and simply assumes that reverse indirect network effects would be material, without providing any evidence of his own that they are. I discuss this further below.

8. The other critiques by Apple’s experts of my conclusion that there is a relevant foremarket consisting of smartphone OSs—iOS and Android—in which Apple has substantial market power are based mainly on their erroneous finding that there is a digital game transaction platform market, as I explain next.

#### **IV. There Is a Relevant Antitrust Aftermarket for iOS App Distribution, Apple Has Monopoly Power in That Market, And Apple’s Restrictions Have Caused Anticompetitive Effects In That Market**

##### **A. Relevant Antitrust Aftermarket for App Distribution**

9. I have presented detailed quantitative and qualitative evidence for assessing the relevant antitrust aftermarket for app distribution.<sup>8</sup> The evidence shows that iOS app users cannot

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<https://www.oecd.org/competition/rethinking-antitrust-tools-for-multi-sided-platforms.htm>, at 47-49; Michal Gal and Daniel Rubinfeld (2016), “The Hidden Costs of Free Goods: Implications for Antitrust Enforcement,” *Antitrust Law Journal*, 80(3): 521-562; James Mancini and Cristina Volpin (2018) on behalf of the OECD Secretariat, “Quality Considerations in Digital Zero-Price Markets,” OECD, [https://one.oecd.org/document/DAF/COMP\(2018\)14/en/pdf](https://one.oecd.org/document/DAF/COMP(2018)14/en/pdf); David Mandrescu (2018), “The SSNIP Test and Zero-Pricing Strategies - Considerations for Online Platforms” *European Competition and Regulatory Law Review*, 2(4): 244-257; John Newman (2015), “Antitrust in Zero-Price Markets: Foundations,” *University of Pennsylvania Law Review*, 164(1): 149-206; John Newman (2016), “Antitrust in Zero-Price Markets: Applications,” *Washington University Law Review*, 94(1).

<sup>7</sup> Schmalensee Testimony, ¶¶ 81-89.

<sup>8</sup> Opening, Section VI.

rely on non-iOS app distributors, and face material sunk and switching costs that result in few being willing to replace their iPhones with an Android phone. It also shows that developers cannot rely on non-iOS app distributors to reach the installed base of iOS app users who account for a substantial portion of their addressable market. Nor can they count on iOS app users switching to non-iOS alternatives. I supplemented this analysis by collecting data and performing HMTs for the two-sided transaction platform market as well as two separate single-sided ones.<sup>9</sup> The data I collected, and HMTs I performed, confirm the findings from the other qualitative and quantitative evidence I put forth.

10. Apple's experts have two main critiques of my iOS app distribution market: (1) they claim the relevant antitrust market is digital game transactions, which I will show is not defensible; and (2) they disagree with my market definition analysis, including wrongly claiming my HMTs are invalid, that switching costs are not high, and that foremarket competition will discipline aftermarket conduct.

### **1. Apple's Epic-Centric Digital Game Transaction Platform Market**

11. Apple's experts have deviated from the standard approach taken by antitrust economists in two ways that are fatal to their proposed game transactions market. (a) They have centered their market definition analysis around the plaintiff (Epic, a business that uses the App Store) rather than the defendant (Apple, the supplier of the App Store). (b) They don't ask, and therefore do not answer, the key question for market definition: which products, from which suppliers, are substitutes for each other in the sense that customers would switch suppliers in sufficient numbers to discipline the exercise of market power, such as a price increase.

#### **a. Customer-Centric Market Methodology Is Wrong**

12. The customer-centric approach does not address the fundamental goal of market definition analysis, which is to identify the set of suppliers that could constrain the defendant's exercise of market power. To answer that question, the antitrust economist needs to consider which suppliers offer substitute products and whether *enough* customers would switch to discipline the defendant's behavior. Whether one *specific* customer or specific type of customer could switch is uninformative.

13. The customer-centric approach makes the result of the economic analysis depend on the identity of the party that challenged the conduct. Under Apple's experts' approach, the economic analysis of the same conduct by the same firm involving the same set of facts could therefore have different outcomes depending on whether the complaining party is a customer with better substitution options, a customer with no substitution options, a competitor, or a governmental competition authority. Apple's experts acknowledged that their customer-centric approach has this implication. This plaintiff-centric approach is a nonsensical economic method of defining the market in which to assess the effects of a firm's conduct.

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<sup>9</sup> Opening, ¶¶ 66-69, 131-134, 256-263.



14. Apple's experts' analysis is further undermined by their almost exclusive reliance on data relating to Fortnite. Unlike most iOS apps, even most iOS game apps, Fortnite is available on gaming consoles and personal computers, meaning that quantitative evidence of substitution for Fortnite is not representative of all iOS apps or even iOS game apps. Fortnite users may have more potential substitution possibilities than users of other apps, including other game apps. Apple's experts' reliance on this non-representative data in implementing their customer-centric market definition analysis renders their analysis unreliable and irrelevant to assessing the conduct at issue, which applies to all iOS apps.

**b. Evidence on Customer Alternatives**

15. As noted above, the guiding principle for market definition is whether products are sufficiently strong substitutes, in the sense that a significant amount of consumer demand would switch between them in the face of a price increase; when that is the case, those products belong in the same market. Economists can address that question with quantitative evidence, or qualitative evidence. But not with no evidence: Apple's experts mainly show that app users and developers have "access" to alternative ways to play games, without demonstrating—with either quantitative evidence that there is in fact economically significant substitution or qualitative evidence from which an economist could infer economically significant substitution—that these alternatives are, in fact, ones to which customers would turn in sufficient numbers if Apple exercised market power. As shown by Dr. Cragg, almost none of the evidence they present provides pertinent information for evaluating substitution as that term is used in market definition, and in the limited cases where it could the evidence shows the alternatives are not substitutes.

16. Apple's experts don't argue that gaming consoles are not substitutes for iPhones as devices, but claim game transactions on consoles might be substitutes for game transactions on iPhones. I showed in my opening testimony,<sup>10</sup> however, that non-smartphone devices are not good substitutes for using smartphone apps, including game apps, at the times and places that users want to use them. Apple's experts also claim that a user could use a website to buy in-game items and then use the items within the iOS app. But Apple's anti-circumvention rules ensure that is not a meaningful constraint on the App Store's market power. Those rules prohibit developers from targeting iOS users to inform them they can purchase items outside the app, let alone attempt to persuade them to use those options.<sup>11</sup> Apple also requires developers to make available in the iOS app in-app content that is available for purchase elsewhere (except for

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<sup>10</sup> Opening, Sections V.A-B.

<sup>11</sup> Professor Hitt claims that I have assumed away options for developers and consumers by excluding tablets from the relevant markets. (Hitt Testimony, ¶¶ 230-233) Tablets do not provide the same convenience for mobile use that smartphones do, which is why 95% of tablet owners also have a smartphone. SEA\_00026543 at 550. Professor Hitt points to the existence of Amazon Fire OS and Windows as OSs that are used for tablets, which he claims would eliminate the smartphone duopoly I have shown. But any such conclusion would be nonsensical, as Fire OS and Windows are not options for smartphone app users and app developers.



“reader” apps). In addition, leaving an app to make a purchase is not a reasonable substitute to an in-app purchase—and it is not a substitute *at all* for downloading and installing an app.

17. In assessing market definition, Apple’s experts reject standard tools used by antitrust economists and state reasons why they can’t bring substitution evidence to bear in this matter.<sup>12</sup> As Professor Schmalensee says, “If the data were available, I believe that a properly conducted hypothetical monopolist test would lead to the conclusion that the relevant market for game transactions is broader than the App Store.”<sup>13</sup> This speculation about the result of a test that Professor Schmalensee hasn’t performed, based on data he hasn’t collected, is unreliable. At the same time he argues that all HMTs that I did perform, based on data I did collect, should be rejected.<sup>14</sup>

## **2. Apple’s Criticisms of My Market Definition Analysis for the Aftermarket Are Not Valid**

18. In the following I address five main criticisms made by Apple’s experts and show they are wrong. They concern: (a) the HMTs I conducted; (b) the analysis of substitution based on the Fortnite degradation episode; (c) consumer switching between iOS and Android given the importance of sunk and switching costs; (d) the role of the foremarket in disciplining aftermarket competition; and (e) the role of cluster markets.

### **a. Professor Schmalensee Does Not Show That the HMTs Are Wrong and Ignores the Data They Were Based On**

19. Professor Schmalensee presents three reasons why my HMTs for the iOS app distribution market should be rejected. I respond to these below and will elaborate further at trial.

20. The first claims that I failed to account for indirect network effects. But the proper question is whether a price increase for a hypothetical monopolist of iOS app distribution would result in “reverse indirect network effects”—a loss of iOS app users which would result in a loss in iOS app developers which would lead of a further loss of iOS app users—that would make the price increase unprofitable. Professor Schmalensee does not provide any evidence that there would be material reverse indirect network effects or even provide any study that relates to the smartphone business.

21. In fact, based on the study I conducted, including quantitative and qualitative evidence, I concluded that there would not be material reverse indirect network effects. iOS app users do not have any alternatives to a hypothetical monopolist of iOS app distribution. Given that they single-home on iOS, they would have to switch to an Android phone to get apps from Google Play. But I showed that there are substantial sunk costs that lock users into an app ecosystem, and substantial switching costs. Given that the installed base does not change

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<sup>12</sup> Schmalensee Testimony, ¶¶ 81, 106; Lafontaine Testimony, ¶ 37.

<sup>13</sup> Schmalensee Testimony, ¶ 106.

<sup>14</sup> Schmalensee Testimony, ¶¶ 9-10, 19, 83, 106.

materially in response to a price increase, developers don't have any choice but to continue distributing iOS apps. As long as users continue to use their iPhones to use apps, developers have to serve those customers there. The reverse indirect network effects do not kick in, in any material way, contrary to Professor Schmalensee's purely conjectural discussion.

22. Professor Schmalensee's second claim is that I failed to account for most of the 14 factors identified in a 2007 paper I co-authored with Professor Michael Noel. He does not say that I could have accounted for them but did not—rather, he says that it is not *possible* to do a SSNIP test for this two-sided market, given the available evidence. In fact, I used quantitative and qualitative evidence to address the relevant economic factors discussed in Evans-Noel in the HMT for the iOS app distribution market.

23. Professor Schmalensee's third claim is that my analysis suffers from what he calls an “inverse cellophane fallacy” because I found that Apple could raise prices and secure even higher profits than it has now. This isn't a fallacy at all but a reflection of Apple's decision not to exercise its full monopoly power in the face of intense scrutiny over its practices since at least 2015, which is about half of the lifespan of the App Store. Contrary to Professor Schmalensee's claim, this scrutiny is not a recent development.<sup>15</sup>

24. In his discussion of the App Store's market power in his digital game transaction platform market, Professor Schmalensee makes another claim relevant to the HMTs. He says, “Apple must also provide app developers incentives to develop and maintain their apps for the iOS platform, instead of competing platforms. As I noted previously, competing platforms do not generally seek to persuade developers to permanently abandon rival platforms.”<sup>16</sup> Neither he nor Professor Hitt show that these rival platforms actually impose competitive constraints that force the App Store to provide these incentives, and my analysis shows that the App Store has invested little in doing so.<sup>17</sup> Professor Schmalensee goes on to say that, “Nonetheless, Dr. Evans assumes that developers have only two options: to continue operating in the App Store or to leave the platform.”<sup>18</sup> In fact, those are the only two material options available to them if they want to market their business to the sizeable portion of their addressable market accounted for by iPhone users. Professor Schmalensee provides no data or analysis that developers could defeat an exercise of market power by Apple by reducing their investment in serving about half their market.

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<sup>15</sup> Schmalensee Testimony, ¶ 99. Early examples of this scrutiny include the consumer class action *Pepper v. Apple* (filed in 2011) and the 2015 FTC investigation of Apple's dealings with music streaming services. *Apple Inc. v. Pepper*, 139 S.Ct. 1514, 1519 (2019); Micah Singleton, “FTC investigation into Apple heats up, music streaming services hit with subpoenas,” *The Verge*, July 21, 2015, <https://www.theverge.com/2015/7/21/9009881/apple-ftc-investigation-music-streaming-30-percent-tax>.

<sup>16</sup> Schmalensee Testimony, ¶ 124.

<sup>17</sup> Opening, ¶¶ 188-189 and Table 7.

<sup>18</sup> Schmalensee Testimony, ¶ 124.

**b. Professor Hitt's Analysis of the Fortnite Degradation Event is Wrong and His Calculations Support My Findings**

**i. Professor Hitt's Calculations Support My Findings**

25. To provide evidence on whether a developer could drop its iOS app in the face of an increase the price of iOS app distribution, I examined what happened to Fortnite revenue after Apple blocked Fortnite from further updates on iOS (the “degradation event” which approximates what would happen if Fortnite exited iOS entirely). I concluded that Epic would not be able to replace enough revenue from substitution of iOS app users to game consoles or personal computers to make it profitable to drop its Fortnite iOS app in the face of a 10% SSNIP.<sup>19</sup>

26. Both Professor Hitt and I report estimates of the “replacement rate” which equals the gain in non-iOS Fortnite revenue divided by the revenue lost on iOS due to the degradation event. This measures how much lost iOS app revenue Epic replaced from any substitution to game consoles and personal computers. It is the correct measure for comparing the profits that Epic would have from staying on iOS versus not staying on iOS.<sup>20</sup> Professor Hitt reports revenue replacement rates for all iOS users of 22.4%-51.4%, which is very similar to the maximum revenue replacement rate for all iOS users of 45.6% that I reported. Epic would need a replacement rate of at least 87.7% for it to be profitable to drop iOS in response to a SSNIP by a hypothetical monopolist, as shown in my opening written testimony.<sup>21</sup> Thus, I would reach the same conclusion even assuming Professor Hitt's revenue replacement figures were accurate, because even his estimated replacement rate is far too low for developers to be able to discipline price increases by a hypothetical monopolist.

27. Because Fortnite is already available and popular on gaming consoles and PCs, it is much better situated than almost all other developers to attempt to switch users away from iOS. And, as Professor Hitt has noted, Epic has in fact worked hard to persuade Fortnite users to switch away from iOS.<sup>22</sup> If even Epic cannot leave the App Store profitably, few developers could.

28. Professor Hitt also claimed that my analysis is flawed because “the change in circumstance of a single game—Fortnite—does not measure consumers' responses to a non-transitory market-wide change in price in the market setting relevant for this case.”<sup>23</sup> But my analysis does start with a posited *market-wide* price increase, rather than one applicable to a single firm. Faced with a market-wide increase in Apple's commission rate, each developer would logically consider the question of whether it would make more money by leaving iOS and

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<sup>19</sup> Opening, ¶¶ 131-134.

<sup>20</sup> Id.

<sup>21</sup> Opening, ¶ 133.

<sup>22</sup> Hitt Testimony, ¶ 99, Figure 21.

<sup>23</sup> Id., ¶ 245.

losing some or all its iOS revenue versus staying on iOS and paying the higher commission. I use Fortnite only as an example of an app that is among the best situated to induce its users to switch from iOS. As I have shown, the answer is that Apple has significant market power over Epic, and thus likely even more market power over other developers. Professor Hitt also claims that my analysis ignores the possibility that some Fortnite users may have substituted to iOS games that would not have been available if other developers had left iOS following a commission increase to all developers.<sup>24</sup> Given that most other iOS games are not present on game consoles and given that that it was clearly profitable to keep Fortnite on iOS, it is not plausible that there would be any material effect that could result from other game developers leaving iOS.

ii. Professor Hitt's Analysis is Wrong

29. Professor Hitt makes a fundamental conceptual mistake in his analysis of the Fortnite data. Pointing to my replacement rate estimates, he says, "Dr. Evans himself finds that iOS Fortnite users shifted a meaningful amount of Fortnite transactions to other game transaction platforms after the Hotfix, a finding which Dr. Evans characterizes as substitution."<sup>25</sup> His assertion illustrates a flaw that is endemic to Apple's experts' approach to market definition. The relevant market definition question is not whether substitution is *possible* but whether there would be *sufficient actual* substitution to constrain a monopolist from exercising market power. It is always the case, in any real-world market, that a price increase will result in *some* substitution—the point of market definition is whether there's enough substitution to matter.

30. Professor Hitt compounds his conceptual error with a methodological one. He does not use the replacement rate to assess substitution. Instead, he estimates a "retention rate," calculated as total revenue (from all platforms, including revenue that was not subject to the degradation event at all) after the degradation event, divided by the revenue expected in the absence of the degradation event, and measures how much of total revenue is retained. He reports retention rates across all iOS users of 81.1%-87.7%.

31. This "retention rate" is an improper measure for assessing the extent to which iOS revenue could be switched to non-iOS platforms. Consider a simple example. Take a Fortnite player who plays both on iOS and PS4 and spends \$20 on iOS and \$80 on PS4. Suppose if that player could no longer play on iOS, she would spend the same \$80 she typically spends on PS4 but would switch none of the \$20 of iOS spend to PS4. This would give a zero replacement rate—none of the iOS spend is switched to any other platform, while Professor Hitt's retention rate metric would instead be 80% (\$80/\$100). In this case where there is zero switching from iOS to PS4, the metric that Professor Hitt uses to assess whether iOS Fortnite users switched their spending to other platforms reports a nonsensical result of 80%.

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<sup>24</sup> Id., ¶ 246.

<sup>25</sup> Id. ¶ 98.

**c. Professors Hitt and Lafontaine Do Not Disprove that iOS App Users Have High Sunk Costs and Switching Costs**

32. To the limited extent Apple's experts have responded to my extensive evidence on switching costs, they have provided no sound economic reasons to reject that evidence. Professor Hitt claims, wrongly, that switching costs are limited:

- i. He claims "[t]here is no evidence that learning a new operating system is a significant impediment to switching between iOS and Android phones."<sup>26</sup> In fact, press and industry articles commonly emphasize the costs of switching from the OS in which consumers have made sunk cost investments.<sup>27</sup>
- ii. He notes that "[s]martphone OEMs offer services that facilitate transferring data from an iOS device to a new Android device."<sup>28</sup> In fact, as I pointed out, these services were noted by reviewers as being complicated, especially for non-technical users.<sup>29</sup>
- iii. He asserts that "most top apps are available on both Android and iOS, and many developers allow users to transfer content between devices through single-sign on."<sup>30</sup> In fact, users have data, paid apps, in-app purchases, and purchased media that do not transfer to Android.<sup>31</sup> Apple executives have emphasized these sunk cost investments as factors that inhibit switching to Android and sought to increase them: "Who leaves Apple products once they've bought apps, music, movies, etc!"<sup>32</sup>
- iv. He says that "[m]ultiplatform services such as WhatsApp and Zoom provide alternatives to Apple's iMessage and FaceTime, and studies confirm that having friends or family that use iOS devices is not a significant reason why iOS device owners choose not to switch to Android

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<sup>26</sup> Id., ¶ 214.

<sup>27</sup> As examples see PX2648; PX0079; Michelle Huang, "Here's why it's so hard to switch from Apple to Android," Business Insider, June 10, 2019, <https://www.businessinsider.com/apple-to-android-switch-new-phone-stuck-ecosystem-2019-6>; Joanna Stern, "Ugh, Green Bubbles! Apple's iMessage Makes Switching to Android Hard," The Wall Street Journal, October 18, 2018, <https://www.wsj.com/articles/ugh-green-bubbles-apples-imessage-makes-switching-to-android-hard-1539867600>.

<sup>28</sup> Hitt Testimony, ¶ 214.

<sup>29</sup> PX2648; Huang, *supra* note 27; Stern, *supra* note 27;.

<sup>30</sup> Hitt Testimony, ¶ 214.

<sup>31</sup> PX2648; PX0079; Huang, *supra* note 27.

<sup>32</sup> PX404.

devices.”<sup>33</sup> The fact that there is an alternative service that could be used on Android does not mean that iPhone users would find it satisfactory.<sup>34</sup> There is extensive evidence that dependence on Apple services such as iMessage is a major factor preventing iPhone users from switching to Android. As a Wall Street Journal review put it: “Apple’s iMessage Makes Switching to Android Hard: Apple’s messaging service is the glue that keeps us stuck on iPhones.”<sup>35</sup>

33. Professor Hitt also argues that certain switching costs reflect “valuable services that Apple provides and are consistent with iOS devices being differentiated products.”<sup>36</sup> That misses the point because users lose these benefits if they switch to Android, which limits switching that could discipline Apple’s market power in the foremarket, and therefore the aftermarket. It is a basic principle of antitrust economics that product differentiation—including differences in quality between suppliers—limits switching and reduces competition between providers.

34. In addressing the magnitude of switching to Android, Professor Hitt notes a single report that includes a datapoint of 26% that occurred during the pandemic,<sup>37</sup> that is inconsistent with all the other data, and recognized by Apple itself as anomalous.<sup>38</sup> The evidence shows that only about 10% of iPhone users switch when they buy a new smartphone, which is consistent with the other report Professor Hitt referenced with a 7% switching rate.<sup>39</sup> As I explained in my opening testimony, recognizing the fact that only about 20% of iPhone users replace their iPhones each year, this means only about 2%—10% of the 20%—of the installed base of iPhone users typically moves to Android each year.<sup>40</sup>

**d. Professor Lafontaine Does Not Provide Valid Economic Evidence that Foremarket Competition Disciplines Aftermarket Competition**

35. Rather than dispute the existence of switching costs, Professor Lafontaine disputes their relevance by challenging the applicability of the foremarket/aftermarket

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<sup>33</sup> Hitt Testimony, ¶ 214.

<sup>34</sup> Professor Hitt cites to a single document to support his claim. That document (DX-3598.027) in fact lists family and friends being on iOS as one of the “Top BARRIERS” to considering Android, albeit lower than other factors such as preference for iOS and having only ever used iOS.

<sup>35</sup> Stern, *supra* note 27. Also see PX2648.

<sup>36</sup> Hitt Testimony, ¶¶ 211-213.

<sup>37</sup> *Id.*, ¶ 209.

<sup>38</sup> PX747.9-PX747.10.

<sup>39</sup> Opening, ¶ 88; Hitt Testimony, ¶ 209.

<sup>40</sup> Opening, ¶ 88.



framework. She instead looks at a market for smartphones, which she says is very competitive. But developers write apps for OSs, not smartphones, so that is the relevant market from the developer side. Consumers also make purchasing decisions based in meaningful part on the smartphone OS, which is a duopoly market.

36. She also claims that consumers have adequate information about smartphone lifecycle costs,<sup>41</sup> but she does not present evidence they do and are able to assess those costs. The situation for an iPhone is very different from that for an HP inkjet printer, one of her foremarket examples. For an HP printer, there is a single aftermarket purchase that consumers know they will repeatedly make: the reason a person has a printer is to print, which uses ink in a predictable way and that costs a lot relative to the price of the printer. App spending is different: users may not even know which of the millions of available apps they will use in the future, which app purchases they will want to make, how much those developers will charge, and the extent to which the developer would pass on App Store commissions. Overall, App Store commissions are [REDACTED] of Apple's total revenues from commissions and hardware sales, so they are a small portion of the lifecycle costs incurred by iOS users.<sup>42</sup>

**e. Professor Lafontaine Is Wrong that the iOS App Distribution Market Is an Inappropriate Cluster Market**

37. Professor Lafontaine views it as appropriate to consider only game apps because “game transactions are economically distinct from transactions for other types of apps” and opines that considering a market that includes non-game apps would be an improper “cluster market”.<sup>43</sup> The concept of cluster markets is inapplicable here because the alleged conduct at issue applies broadly to all apps. Apple's App Store restrictions cover the distribution of all iOS apps and mandate the use of IAP for all digital content purchases within iOS apps, without distinction based on the type of app, whether by game or non-game apps, or otherwise.<sup>44</sup>

38. If the challenged practice here concerned anticompetitive practices by game developers, it may be appropriate to consider the particular apps sold by those developers and whether as a matter of analytical convenience it would make sense to consider a cluster market of all game apps rather than analyzing the effects of those practices on individual game apps or genres of game apps. This case, however, focuses on the specific conduct of a single firm, and as I have explained, defining a market in which to analyze that conduct requires identifying the

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<sup>41</sup> Lafontaine Testimony, ¶ 51.

<sup>42</sup> Opening, ¶ 118.

<sup>43</sup> Lafontaine Testimony, ¶¶ 26-35.

<sup>44</sup> The only major distinction between the treatment of types of apps by the App Store I am aware of and that Apple's experts have pointed to is the “reader app” exception. See Hitt Testimony, ¶ 101. (In addition, there is the Video Partner Program that is specific to premium video services that meet certain conditions.) Apps, such as game apps, that do not qualify for this reader exception, cannot offer in-app content without making it available through IAP.



competitive constraints on that conduct as a whole. Here, that is the app distribution restrictions that Apple imposes on all developers and users.

39. [REDACTED]

## **B. Apple's Market Power in App Distribution**

40. I showed that Apple's profit margins, seen in the context of the formation and evolution of the App Store, provide strong evidence that Apple has monopoly power, and that the fact that it has maintained essentially the same commissions, in the face of high profits, is further evidence of that power. I address two critiques here: Professor Schmalensee's claim that Apple's P&Ls for the App Store should be disregarded, and Professor Hitt's claim that Apple's commission rates are much lower than 30% and have been declining.

### **1. Apple's Reported App Store Profit Margins Provide Reliable Evidence of Monopoly Power**

41. Professor Schmalensee raises six critiques of my App Store profit analysis.

42. First, he claims that accounting profits may be a poor measure of economic profitability, citing literature that certain investments, such as R&D, may be recognized for accounting purposes at a different time from when they provide economic value.<sup>45</sup> He has not demonstrated that these issues matter here. The App Store has a low R&D/sales ratio, so recognition of R&D could not cause a material bias.<sup>46</sup> He has not identified any other investments like R&D that could cause bias and there is no evidence in the record, or in the App Store financials, that there are any. Professor Schmalensee's scholarly work has found that "persistent excess profits provide a good indication of long-run power; they show clearly that there is some impediment to effective imitation of the firm in question", and other economists agree.<sup>47</sup> Now he says it is only "suggestive."<sup>48</sup> The App Store's profit margins have been persistently and unprecedently high since at least 2013.

43. Second, he says that that any estimate of the App Store's profit margins is inherently arbitrary and that top Apple executives will testify that "Apple does not calculate

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<sup>45</sup> Schmalensee Testimony, ¶ 111.

<sup>46</sup> Opening, Table 7.

<sup>47</sup> Richard Schmalensee (1982), "Another Look at Market Power," *Harvard Law Review*, 95(8): 1789-1816, at 1806; Louis Kaplow and Carl Shapiro (2007), "Antitrust," in A. Mitchell Polinsky and Steven Shavell (eds.), *Handbook of Law and Economics*, Vol. 2, 1073-1225, at 1089-1090.

<sup>48</sup> Schmalensee Testimony, ¶ 111.

P&Ls by products and services because they view it as an unproductive exercise.”<sup>49</sup> In fact, however, Apple has calculated App Store profits repeatedly: estimates for 2016-2020 from Apple’s corporate finance team produced from Mr. Cook’s files; App Store P&Ls in Apple’s internal App Store presentations to senior management at least annually from 2018-2020; App Store P&L covering 2013-2015 requested by Apple’s CFO.<sup>50</sup>

44. Third, he claims that App Store profitability is not meaningful because there are joint costs, in particular R&D, for which any allocation to the App Store would be arbitrary.<sup>51</sup> In fact, however, Apple financial documents show that Apple attributed [REDACTED] of its R&D spending directly to specific product lines—such as iPhone, Mac, or Services (including the App Store)—and had to allocate only a small portion among product lines.<sup>52</sup>

45. Fourth, he says that it does not make sense to assess the App Store’s profitability in isolation as it is only one part of the iOS platform.<sup>53</sup> Had he considered the other parts of the iOS platform, he would have found that they too are highly profitable, so there is no sense in which the App Store’s profits are offset by significant losses on other parts of the iOS platform.

[REDACTED]

<sup>49</sup> Id., ¶ 115.

<sup>50</sup> PX2385.18; PX2391.105-108; PX2392.3; PX602.154; PX608.78; PX2302.94; PX610.

<sup>51</sup> Schmalensee Testimony, ¶¶ 115-116.

<sup>52</sup> PX2385.24.

<sup>53</sup> Schmalensee Testimony, ¶¶ 115-16.

<sup>54</sup> PX2392.2. [REDACTED]

[REDACTED] Apple is also widely understood to be disproportionately profitable as a smartphone OEM. Analysts estimate that Apple has accounted for two-thirds to 92% of smartphone profits, but less than 20% of unit sales and approximately one-third of revenue. Shira Ovide and Daisuke Wakabayashi, “Apple’s Share of Smartphone Industry’s Profits Soars to 92%,” The Wall Street Journal, July 12, 2015, <https://www.wsj.com/articles/apples-share-of-smartphone-industrys-profits-soars-to-92-1436727458>; Patrick Seitz, “Apple Rakes In 87% Of Smartphone Profits, But 18% Of Unit Sales,” Investor’s Business Daily, February 28, 2018, <https://www.investors.com/news/technology/click/apple-rakes-in-bulk-of-smartphone-profits-but-small-slice-of-unit-sales/>; John Koetsier, “Global Phone Profits: Apple 66%, Samsung 17%, Everyone Else: Unlucky 13%,” Forbes, December 22, 2019, <https://www.forbes.com/sites/johnkoetsier/2019/12/22/global-phone-profits-apple-66-samsung-17-everyone-else-unlucky-13>.

<sup>55</sup> PX2392.2-PX2392.3.

46. Fifth, Professor Schmalensee asserts that App Store margins reported by Mr. Barnes are unreliable.<sup>56</sup> In fact, Mr. Barnes' estimates are highly consistent with Apple's estimates. The operating margin for 2019 was 82.8% from the App Store P&Ls, 79.6% from Mr. Barnes' conservative estimate, and 77.8% from the profitability analyses produced from Mr. Cook's files.

47. Sixth, Professor Schmalensee reports a comparison of profit margins for publicly traded companies that operate digital distribution platforms in his Exhibit 2, which he says shows that "Apple's operating margin is unremarkable."<sup>57</sup> Professor Schmalensee's exhibit is fundamentally flawed as a comparison of profits of "online digital distribution platforms": the company-level profits he reports include entire lines of business that are not remotely related to "online digital distribution platforms"—e.g., Facebook is included because it happens to operate a store for its Oculus VR headset, but its profits reflect its massive online advertising business, not its extremely small Oculus store. [REDACTED]

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## 2. Professor Hitt's Commission Calculations Are Unsound

48. Apple's commission structure—free for free apps and 30% for paid apps and in-app purchases—has remained unchanged with modest exceptions. Professor Hitt's Figures 39 (game apps) and 51 (all apps), which purport to show a decline in the commission rate for initial app downloads, incorrectly assume the commission rate for free downloads is 0%. That makes no economic sense because the commission rate for a free download, for which the developer does not charge, could also be 30%, 100%, or any other percentage: any percent times zero is zero. These transactions do not have a commission of 0%; there is no price on which a commission could be charged, so a sound apples-to-apples analysis of the commission rate properly excludes these transactions. Professor Hitt's reported decline in the commission rate for downloads is an artifact of his assuming a 0% commission rate for free downloads combined—apples with oranges—with the increase in the share of free downloads over time.

49. Free downloads have increased over time because the App Store's revenues have shifted almost entirely to commissions on in-app purchases in "freemium" apps with no upfront price for the app download. [REDACTED]

[REDACTED]<sup>59</sup> For in-app purchases, the commission rate has remained essentially unchanged, as shown in Professor Hitt's Figure 52.<sup>60</sup> Meanwhile, the average dollar commission paid by developers has increased dramatically, seven-fold from about \$0.38 to \$2.77

<sup>56</sup> Schmalensee Testimony, ¶ 115.

<sup>57</sup> Id.

<sup>58</sup> PX2392.3; Opening, Table 3.

<sup>59</sup> PX2367.2-PX2367.4.

<sup>60</sup> The erroneous assumption of a 0% rate on zero revenue transactions also impacts this exhibit but has a smaller effect as the proportion of such transactions is lower.

as shown in Professor Hitt's Figure 40 (game apps), and five-fold from about \$0.49 to \$2.60 (all apps).<sup>61</sup>

50. Professor Hitt's estimate that "developers paid Apple an average commission rate of 8.1% for games and 4.7% for all apps" improperly combines two different kinds of transactions—downloads and in-app purchases.<sup>62</sup> (This combined metric appears for the first time in his direct testimony; it was not reported in either of his expert reports.) It makes no economic sense to average the price of two different types of products, like a gallon of milk and a bag of oranges. The result does not provide meaningful economic information, because the average does not show whether prices have changed or instead whether consumers have shifted their purchases, *e.g.*, buying more oranges and less milk. His calculations are also wrong for the same reasons as his Figures 39 and 51, in that they incorrectly assume the commission rate for free transactions is 0%. Taking his (nonsensical) approach as given, however, Apple's commission rate has *increased* significantly over time, as shown by Dr. Cragg.

### **3. Professor Hitt's Criticisms of Case Studies of App Distribution in the Absence of Restraints Are Not Valid**

51. Professor Hitt criticizes the case studies I presented on app distribution for Android in China and for Windows and macOS personal computers. He argues that there are negative consequences from competition being skewed because larger developers negotiate better terms or can more readily use direct distribution as an option. The fact that a more competitive app store market means that larger customers receive better terms might be a consideration for someone designing industrial policy or for a central planner, but it is not a concern for antitrust policy. He also argues that app distribution in China is of lower quality because developers may face increased costs of dealing with multiple app stores. His claim that dealing with multiple app stores involves transactions costs is inconsistent with his claim of a broad games transaction market, which he claims includes at least 14 prominent platforms. Professor Hitt's argument is tantamount to the view that life would be easier with a monopoly App Store with a single set of terms, ignoring how the absence of competition would affect those terms to the detriment of developers and users.

52. Professor Hitt claims that the price of app distribution for personal computer applications is not lower than for iOS apps. He is wrong. He acknowledges that the Epic Games Store ("EGS") charges only 12%, which is much lower than the App Store's 27.7% average rate but appears to argue that it should be discounted because EGS is not yet profitable and he claims it has been growing more slowly than the market as a whole.<sup>63</sup> The fact that a new entrant may incur losses early on is unremarkable and, as Professor Hitt acknowledges, EGS is projected to be profitable.<sup>64</sup> Moreover, EGS has already had a competitive impact in its short existence, [REDACTED]

<sup>61</sup> The "all apps" calculation comes from Exhibit 65 of Professor Hitt's rebuttal report that Apple served in discovery.

<sup>62</sup> Hitt Testimony, ¶ 180.

<sup>63</sup> *Id.*, ¶ 256.

<sup>64</sup> *Id.*

53. Professor Schmalensee’s analysis is based on the fundamental proposition that IAP is just a mechanism that Apple uses to “monetize” its iOS platform and that IAP provides an efficient way for Apple to collect commissions from developers as part of its efforts.<sup>67</sup> He claims that Apple is no different from an art gallery that’s just collecting its due from artists by making customers use its store payment terminal.

55. Apple has a monopoly over the distribution of iOS apps—one that resulted from anticompetitive foreclosure of competing app stores.<sup>68</sup> But for that foreclosure, developers would have a choice of whether to use Apple’s payment solution and competition would take place on the merits, as has occurred with Windows and Mac computers and for Android in China. Even if one accepts that the App Store is a lawful monopoly, there is no economic reason why Apple should be able to force developers to use its payment solution to enhance its profits, when doing so harms competition, raises prices, reduces quality, and slows innovation.

56. Professor Schmalensee has not responded to much of the economic analysis and evidence presented in my opening testimony, perhaps because of our diametrically opposed positions. He does make four key claims, following each of his main section headings: (i) IAP is not an “integral part” of the App Store apart from Apple saying it is; (ii) Apple could provide IAP and app distribution separately; (iii) my proposed iOS in-app payment solution market is based on a sound HMT and properly confined to digital content apps with in-app purchases targeted by Apple; and (iv) Apple does require the use of IAP as condition of app distribution for the targeted apps.<sup>69</sup> I show in the following that each is wrong as a matter of economics and contrary to the facts.

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### **A. IAP Is Not an Integral Part of the Part of the App Store**

57. I showed in my direct testimony that Apple’s payment solution, which is the main service provided by IAP, was created before the App Store, has operated outside of it, and is used for many different Apple services, only one of which is the App Store.<sup>70</sup> Professor Schmalensee argues that “IAP is an input into the production of App Store transactions” like American Express merchant acceptance.<sup>71</sup> This claim makes no economic or factual sense. American Express cannot offer credit-card transaction services for consumers and merchants unless consumers have its card and merchants accept it. Every credit card transaction involves a merchant that accepts its card. Merchant acceptance isn’t an input into the platform: it is one integral side of the platform. By contrast, Apple can offer distribution services to developers without requiring they use IAP and in fact does so for a vast number of developers, as I’ve shown.

58. To further see the logical and factual flaws in the “IAP is an input” argument, consider payment card terminals, which are in fact inputs into American Express credit-card transactions in physical stores. Every transaction requires a payment card terminal. However, merchants don’t get those terminals from American Express. There are several competing makers of payment card terminals, such as NCR, that sell them directly to merchants or indirectly through third parties hired by merchants. Payment terminals take several brands of cards, including American Express. If American Express required a target group of merchants, say restaurants, to use an Amex payment terminal, that tie would not make the Amex payment terminal a necessary and integral input into Amex’s credit-card network transactions.

59. Professor Schmalensee also claims that in-app payment solutions are integral because other app stores require them. His point is wrong for two reasons. First, he ignores the fact that there are many app stores that do not require that developers use their payment solutions.<sup>72</sup> Second, he ignores the fact that developers often don’t have to use an app store’s payment solution because they can rely on direct distribution—as in the case of personal computers and Android in China<sup>73</sup>—so that the competitive market does not require an integrated in-app payment solution. Both sets of facts demonstrate that it is efficient to have competition that does not involve requiring developers to use an app store’s in-app payment solution.<sup>74</sup>

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<sup>70</sup> PX2690.

<sup>71</sup> Schmalensee Testimony, ¶ 136.

<sup>72</sup> Opening, ¶ 246.

<sup>73</sup> Opening, ¶¶ 107-108.

<sup>74</sup> Game consoles have adopted a radically different business model from general purpose OSs. Opening, ¶ 16.



## **B. Apple Could Provide IAP and App Distribution Separately**

60. To contend that it would not be possible for Apple to provide IAP and app distribution separately, Professor Schmalensee poses two extreme cases, neither of which is valid. At one extreme, he says Apple will insist on being paid its 30% commission from developers so of course they would take its “free” payment solution too.<sup>75</sup> There are at least two problems with this claim. (i) Professor Schmalensee presents no basis for the conjecture that Apple could continue to insist on its 30% commission on in-app purchases in the absence of mandating IAP. (ii) Requiring that developers pay a 30% commission but get IAP for free would simply be a price tie, and anticompetitive for reasons explained in my opening testimony.<sup>76</sup>

61. At the other extreme, he contends Apple would not provide IAP separately because if developers could avoid paying the commission by not taking IAP then there would be no demand for IAP.<sup>77</sup> But Professor Schmalensee wrote at length about the purported benefits that IAP provides developers.<sup>78</sup> He does not explain why six paragraphs later he now feels that Apple cannot compete on the merits with its payment solution and appears to be conceding that IAP is not worth anything close to a 30% commission. I believe that IAP likely does provide benefits that would result in some developers, particularly small ones, using it exclusively and other developers offering it to their users as an option—particularly at the right price, and that Apple could compete on the merits.

## **C. The iOS In-App Payment Solution Market Is Based on Sound Application of the HMT**

62. Professor Schmalensee says that my SSNIP (i) “relies on the assumption that the App Store commission rate is properly comparable to the payment processing fees charged by Paypal [sic], Braintree, and others” but that (ii) “the commission rate in the App Store is not a fee for payment processing; it is the price developers pay for the full array of benefits provided by the App Store and the iOS platform.”<sup>79</sup>

63. The first statement is obviously false since the *competitive commission rate* I used in the SSNIP calculation was 23.2% and not the roughly 5% commission rate charged by online payment processors.<sup>80</sup> I determined this highly conservative rate under the assumption that most developers would still use IAP at a 30% commission because of its perceived value while the remainder would use their own payment solutions and pay processing fees of 5%. Even under this conservative assumption, which accepts for the sake of argument that IAP provides some

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<sup>75</sup> Schmalensee Testimony, ¶¶ 157-158, 161.

<sup>76</sup> Opening, ¶¶ 286-293.

<sup>77</sup> Schmalensee Testimony, ¶ 160.

<sup>78</sup> Id., ¶ 152-154.

<sup>79</sup> Schmalensee Testimony, ¶ 166.

<sup>80</sup> Opening, ¶ 261.



developers valuable services, it is clear the App Store, acting as a monopolist, could increase the average commission rate substantially from the competitive level.

64. The second statement is devoid of any economic content and simply repeats Apple's preferred characterization of its fee. Ultimately, Professor Schmalensee's view reduces to the proposition that Apple can charge whatever it wants, without regard to competition among payment solutions, because no one else can grant access to the iOS platform. This characterization of the fee is at odds with the facts. (i) Mr. Jobs didn't say Apple was charging developers a commission to cover the costs of the *iOS platform*. He said it was to cover the costs of the *App Store*. (ii) [REDACTED]

#### **D. Apple Does Require IAP As a Condition of Distribution of Targeted Apps for the App Store**

65. Professor Schmalensee says that "even if app distribution and payment solutions are separate products, there is no 'tie' here because Apple does not even require that developers monetize their app by offering in-app purchases of digital content or require payment for any app in order to take advantage of app distribution through the App Store."<sup>81</sup> This statement reflects his unwillingness to take seriously Apple's immense monopoly power over the app economy and the coercive nature of its IAP requirement for the developers of the hundreds of thousands of apps that are subject to it.

66. Apple's IAP requirement applies to any iOS app developer who sells digital content to customers who use its app (except for "reader" apps). Professor Schmalensee says that Apple has not "tied" because those hundreds of thousands of developers could have created a different business. Instead of developing Fortnite, Epic could have created an ad-supported casual game for iOS or perhaps a ride-sharing service. Professor Schmalensee has provided no economic evidence that developers who have—or want to create—businesses subject to Apple's IAP tie could have profitably launched different businesses. The hundreds of thousands of businesses subject to Apple's IAP requirements don't believe they could do something else that would enable them to avoid the tie—otherwise they would have done so and avoided the 30% commission. That's the nature of coercion. Most importantly, it doesn't matter if they could: that a developer would choose to forgo starting a business to avoid the tie is itself evidence of the tie's harm to competition and consumers who are denied new and innovative products.

67. Professor Schmalensee concludes by saying that app developers can just have their users make purchases on other platforms and thereby avoid IAP.<sup>82</sup> Apple has thought of that. If a developer sells in-app digital content on another platform, Apple requires that they make it available for purchase in their iOS app too. Then Apple forbids developers from providing any information in their iOS app that would let users know they could make purchases

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<sup>81</sup> Schmalensee Testimony, ¶ 171.

<sup>82</sup> *Id.*, ¶ 174.

on another platform.<sup>83</sup> So developers must sell in-app content using IAP if they want the monopoly App Store to carry their app.

## VI. Apple's Claimed Procompetitive Justifications

68. [REDACTED]

A. [REDACTED]

69. The available evidence does not support [REDACTED] the view that an OS provider must distribute apps exclusively to operate efficiently much less that competition would be ruinous. Microsoft Windows has never had an exclusive app store and has always enabled direct distribution of apps, which has enabled developers of stores, such as iTunes and Steam, to create highly successful businesses without paying Microsoft for distribution. But Windows has thrived. Globally, Windows is installed on about 1 billion personal computers and has more than 35 million apps.<sup>84</sup>

70. The Android smartphone ecosystem in China has been extremely successful even though multiple competing app stores and direct distribution are the norm. China had approximately 864 million smartphone users in 2019, 26% of all smartphone users globally.<sup>85</sup> That is far more than China's 18% share of global population and 16% share of global GDP.<sup>86</sup> Daily usage of Android devices in China was the second highest of the twelve countries reported by App Annie, significantly above usage in the U.S.<sup>87</sup> (Professor Hitt makes the claim that "The growth of game transactions is lower in China than in the U.S. after accounting for the growth rate in smartphone ownership in each country." He did not provide any support for this claim in his testimony but, as I will explain at trial, if necessary, the calculations that support this statement in his rebuttal report are based on a nonsensical comparison.)

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<sup>83</sup> PX2558, Sec. 3.1.3.

<sup>84</sup> Stuart Elliott, "The Billion Designers of Windows 7," The New York Times, October 21, 2009, <https://www.nytimes.com/2009/10/22/business/media/22adco.html>; Michael Fortin, "Windows 10 Quality approach for a complex ecosystem," Microsoft, November 13, 2018, <https://blogs.windows.com/windowsexperience/2018/11/13/windows-10-quality-approach-for-a-complex-ecosystem/>.

<sup>85</sup> PX2749.6-PX2749.7; PX2750.6-PX2750.7.

<sup>86</sup> The World Bank, "Population, total," <https://data.worldbank.org/indicator/SP.POP.TOTL>; The World Bank, "GDP (current US\$)," <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

<sup>87</sup> PX2654.7.

71. The available evidence does not support [REDACTED] the view that requiring Apple to compete on the merits in app distribution would blunt its incentives to innovate. [REDACTED]

[REDACTED] a median of 11.4% for the benchmark online marketplaces during 2015 to 2019.<sup>88</sup> Based on the findings in my opening testimony I expect that competition would cause Apple to invest more in App Store R&D and innovation.<sup>89</sup>

**B. Apple Could Operate a Profitable App Store Even if It Faced Competition in App Distribution and Payment Solutions**

72. Apple's experts have a surprising lack of confidence in Apple's ability to compete on the merits. In the absence of restrictions, Apple would still be able to operate the App Store and include it on the installed base of iPhones and any new iPhones it sells. Developers would still have guaranteed access to all users and whatever other value the App Store brings them. And iPhone users would be able to download apps from all developers who found the App Store's proposition compelling. Similarly, in the absence of restrictions, Apple would be able to offer IAP and its payment solution to developers. As noted above, many developers would find its turn-key solution, and massive number of accounts with payment credentials, attractive. It isn't plausible that the App Store can prosper only as a monopolist.

**C. Apple's Experts Have Not Shown Free-Riding**

73. As a smartphone OS provider that also sells devices, Apple does not have a free-rider problem when developers use the platform essentially for free. Free, or essentially so, is the deal that Apple, and other successful OS providers, typically make with developers. Developers and Apple both benefit when the developer offers an iOS app. Apple, like other successful OS providers, would get that benefit whether the app was provided through an independent app store, directly, or through the App Store. Apple, for example, did not free ride when it launched its iTunes app for Windows in 2003 but didn't pay Microsoft for distribution or in-app purchases.

74. To illustrate the point, Apple does not face a free-riding problem from ad-supported apps, such as YouTube, which do not pay the App Store anything for distribution. Apple benefits from those apps by getting more users on its platform. Apple would likewise not face a free-riding problem if some apps, such as Tinder, did not pay IAP commissions. It would make less money—its 80% profit margin would decline—but that doesn't mean that Apple, on net, wouldn't be benefitting from distributing the Tinder app, given that it makes the iOS platform more attractive. This is the same point that Mr. Jobs made on different occasions, that "[t]he developer and us have the same exact interest which is to get as many apps out in front of

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<sup>88</sup> Opening, Table 7.

<sup>89</sup> Opening, ¶¶ 190-219.

as many iPhone users as possible.”;<sup>90</sup> and that “[o]ur purpose in the App Store is to add value to the iPhone. Free apps do that just as well as paid apps sometimes. We love free apps.”<sup>91</sup>

**D. Apple’s Experts Provide No Evidence That Benefits from the iOS Ecosystem Would Be Lower If the App Store Faced Competition for Distribution and Payment Solutions**

75. [REDACTED]

Professors Hitt and Lafontaine argue that the App Store output has grown substantially. Neither expert provides any economic analysis or evidence that Apple’s app distribution or payment processing restrictions *caused* Apple to invest more in the App Store, or the iOS ecosystem more generally, than it would have in the absence of these restrictions, or that ending these restrictions would cause Apple to invest less, or harm app users and developers. It is not enough for Apple’s experts to note that output has increased without showing that this increase resulted from the restrictions at issue, or would decline without them.

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Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct and that I executed this written direct testimony on April 27, 2021, in Marblehead, Massachusetts.

WORD COUNT: 10,517



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David S. Evans

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<sup>90</sup> PX880.21.

<sup>91</sup> PX2060.5.